PONDWATER, BIOFILMS, AND CYSTIC FIBROSIS: INTRODUCING CUTTING EDGE RESEARCH INTO THE HIGH SCHOOL CLASSROOM

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Biofilms are an exciting area of research as they are being implicated in many chronic infections. Unfortunately, biofilms are not addressed in the high school curriculum and are rarely found in the high school biology textbook. As a GK-12 fellow, I developed a way to introduce students to biofilms by modeling my research, *Pseudomonas aeruginosa* biofilm formation in the CF airway, through the introduction of environmental biofilms in an inquiry based learning environment. The students collected pond water as an inoculum and successfully grew biofilms on plastic 96 well plates. These biofilms grew from the environmental bacteria naturally found in the pond water. They stimulated their biofilms with two common household antimicrobials of their choice that they hypothesized would affect biofilm levels. Treatment data was recorded and presented to their peers. They found that certain antimicrobials, such as bleach, dish soap and bathroom cleaner, were effective at destroying biofilms and other antimicrobials, such as mouthwash and hand sanitizer, were ineffective. To demonstrate the effectiveness of inquiry based education, an 8-item scale was employed, comprised of two subscales measuring knowledge of biofilms and experimental design. The scales showed an increase in total posttest scores over total pretest scores. Similarly, knowledge of biofilms and experimental design increased. Furthermore, our laboratory exercise stimulated two senior students to voluntarily study pond water biofilm formation and dissemination as a capstone senior project. Our findings indicate

that an inquiry based lab activity is an effective way to teach students about biofilms and experimental design.

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